

VII. *A Letter from Mr. John Reinhold Forster, F. R. S. to William Watson, M. D. giving some Account of the Roots used by the Indians, in the Neighbourhood of Hudson's-Bay, to dye Porcupine Quills.*

N^o 2, Somerset Stable-yard, Strand.
Jan. 16, 1772.

S I R,

Read Feb. 27,
1772. **A**MONG the curiosities presented by the Hudson's Bay Company to the Royal Society, is a small parcel of porcupine quills, dyed by the wild natives, some red and some yellow, together with the roots of some plants they use for that purpose.

I examined them carefully, at your desire, and found that they are probably of the same kind with those mentioned by Prof. Kalm, vol. iii. p. 14. and 160 of the English translation. The one root, dying yellow, is called by the French in Canada, *Tifavoyanne jaune*; the other, dying red, has the name of *Tifavoyanne rouge*. Prof. Kalm declares the latter to be a new plant, belonging to the genus of *Galium*, and received by Dr. Linnaeus in his *Species Plantarum*, p. 153. by the specific name of *Tinctorium*,

on account of its dying quality. It grows in woody, moist places, in a fine soil. Kalm observes, " that
 " the roots of this plant are employed by the In-
 " dians in dying the quills of the American Por-
 " cupine red, which they put into several places of
 " their work : air, sun, and water, seldom change
 " this colour. The French women in Canada
 " sometimes dye their cloth red with these roots,
 " which are but small, like those of the *Galium*
 " *luteum* or yellow bedstraw."

Dr. Linnæus describes this plant, as having six narrow linear leaves at each knot of the stem, and four at the branches; commonly two flowers are on each stalk, and its seeds are smooth. The roots, when dry, are of the thickness of a crow quill, brown on the outside, and of a bright purple red, when broken, on the inside.

The second plant, or the *Tifavoyanne jaune*, is according to Prof. Kalm, vol. iii. p. 160. " the
 " threeleaved Hellebore (*Helleborus trifolius* Linn.)
 " grows plentifully in woods, in mossy, not too wet,
 " places. Its leaves and stalks are employed by the
 " Indians to dye yellow several kinds of their work,
 " made of prepared skins. The French learned
 " from them to dye wool and other things yellow
 " with this plant."

Among the roots sent as a specimen from Hudson's bay, I found several leaves, which I separated, and found the plant undoubtedly to be the threeleaved Hellebore.

In the 4th vol. of Dr. Linnæus's *Amoenitates Academicæ* is a figure of this plant, which upon comparison I found by no means to be accurate: for
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the leaves in our specimens, and in those collected by a gentleman who favored me with the sight of the plant, are far more pointed, than in the engraved figure. The stalks have constantly but one flower.

The dyed porcupine-quills sent along with the roots from Hudson's-bay, are of the brightest red and yellow: and this circumstance suggested to me the thoughts of trying whether these roots might not be usefully employed in dying. I mentioned it to you, and was encouraged to make such a trial, as the small quantity of the roots would permit.

I boiled a piece of flannel in a solution of half salt of tartar and half alum: the wet flannel was hereupon put into the decoction of the threeleaved Hellebore-roots, and boiled in it for the space of about 12 or 15 minutes; the flannel, when extracted, was dyed with a bright and lasting yellow dye. A white porcupine quill, boiled in the same decoction, became nearly of as bright a yellow, as those sent over from Hudson's-bay. This experiment made me believe, that I had hit upon the right method of dying with the threeleaved Hellebore; and will, I hope, prompt the directors of the Hudson's-bay Company to order larger quantities of this root from their settlements, as it will no doubt become an useful article of commerce.

The flannel, boiled in salt of tartar and alum as above-mentioned, was likewise immersed and boiled for nearly the same space of time as in the former experiment, in a decoction of the root of the *Galium Tinctorium*, but it would dye only a dull and faint red. A porcupine quill boiled with it became yellow, but by no means red. This operation

tion convinced me, that the Indians must certainly have some method or other to extract the bright and lasting colour, which I could not perform. They use perhaps the root quite fresh, which circumstance probably makes them succeed in their dying process. If it could be brought about, to extract and afterwards to fix on wool the dye of this root, it would, no doubt, on account of its bright colour, be a valuable acquisition for our manufactures: and I do not in the least doubt of the probability to succeed in the attempt, as the wollen stuffs are animal substances as well as the porcupine quills, and therefore easily susceptible of any dye.

The directors of the Hudson's-bay Company will, we hope, order their servants at the settlements to examine carefully and minutely, the method employed by the Indians in dying red with this root, and to send an account thereof, and greater quantities of this root over, that several chemists may be enabled to make experiments at large with them; for often, in dying, the experiments will not succeed, when tried in small quantities.

The wild inhabitants of North America are certainly possessed of many important arts; which, when thoroughly known, would enable the Europeans to make a better, and more extensive use of many unnoticed plants, and productions of this vast continent, both in physic, and in improving our manufactures, and erecting new branches of commerce.

To give an instance of this, I will only mention, that the Spaniards of Mexico have but lately learnt of the inhabitants of California; the art of dying

the deepest and most lasting black, that ever was yet known. They call the plant they employ for that purpose Cascalote ; it is arboreous, with small leaves and yellow flowers ; its growth is still slower than that of an oak ; it is the least corrosive of all the known substances employed in dying, and strikes the deepest black ; so that, for instance, it penetrates a hat to such a degree, that the very rags of it are thoroughly black. The leaves of the Cascalote are similar to those of the Husiaoke, another plant likewise used for dying black with, but of an inferior quality. The latitude of California lets us hope, that the country near the Mississippi, or one of the Florida's, contains this Cascalote, the acquisition of which would be of infinite use in our manufactures.

Were Natural History thus employed in applying the natural productions for procuring the necessities, or adding to the comforts and ornaments, of human life, it would for the future free this science from the vulgar opinion, that it is merely speculative, and incapable of being of the least utility in common life ; a prejudice which gains more ground by the injudicious and unprofitable manner, now chiefly in vogue, in studying this branch of human knowledge ; and which might be removed, if powerful trading companies would encourage the efforts of the naturalist, by enabling them to search the treasures of nature, in the various countries subject to the British Crown, and connected with its subjects by trade and commerce. Pardon, Sir, that I detain you so long on a point of which you are so well convinced, and which

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which you have frequent opportunities to convince others of. I am, with the truest regard,

S I R,

Your most obedient,

humble servant,

John Reinhold Forster.